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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,675	03/16/2007	Igor Khrushchev	1006-001	2207
79606 7590 12/03/2009 Buchanan Intellectual Property Office LLC P.O. Box 700 Perrysburg, OH 43552-0700				
EXAMINER				
PAK, SUNG H				
ART UNIT		PAPER NUMBER		
2874				
MAIL DATE		DELIVERY MODE		
12/03/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/575,675

Applicant(s)

KHRUSHCHEV ET AL.

Examiner

SUNG H. PAK

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-10,12-26,28-42,44-56,58-61 and 63-72 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-10,12-26,28-42,44-56,58-61 and 63-72 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-940)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group I in the reply filed on 9/08/2009 is acknowledged. The traversal is on the ground(s) that "the special technical features listed by the Examiner merely reflect the preambles of the listed claims" and that "claims from both groups relate to altered refractive indices and, as a result, searching all the claims would not place an undue burden onto the Examiner." (penultimate paragraph, page 2 of the applicants' reply).

After a careful reconsideration, the Examiner agrees that the term "laser formed by an effective waveguide" merely appears on the preamble of claim 60 (of Group II), and that the actual body of the claim do not contain any recitations or features distinct from what is recited and featured in Group I of the present application. Since a laser device using an optical waveguide structure is widely known in the art and the claims of Group I and Group II share the same claim limitations in the body of the claims, "a laser" claimed in group II appears to be subspecies of optical waveguide structure of Group I. Based on this premise, the restriction requirement presented in the previous office action is hereby withdrawn.

Claim Objections

Claim 30 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Specifically, claim 30 recites, *inter alia*, “wherein the crystal is doped with a metal according to claim 26 in which crystal is doped with a metal.” However, claim 26 on which claim 30 depends, does not recite any “doping” of crystal with metal as referenced by claim 30. As such, claim 30 fails to further limit claim 26 and it is an improper dependent claim per 37 CFR 1.75(c).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3, 6-10, 23-24, 26, 32-39, 42, 44-56, 58-59, 63-64, 69-72 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent Application Publication No. US 2007/0079750 A1 to Miguez et al. (hereinafter "Miguez").

Miguez discloses a method of altering the refractive index of a region of a crystal, and a crystal thus altered, including focusing a pulsed laser beam (paragraph 0063) at a desired location within the crystal and moving the focused beam along a path (paragraphs 0021-0022) such that the focused beam lowers the average refractive index of the region of the crystal along the path (paragraph 0064);

in which the altered region of the crystal comprises a waveguide (paragraph 0002, 0007, 0011);

in which at least a part of the region of altered refractive index is created remote from the surfaces of the crystal (paragraph 0021);

wherein the region is created at variable depth from the surfaces of the crystal (paragraph 0021-0022);

in which the effective refractive index of the region is altered by a predetermined amount (paragraph 0063);

in which the intensity of the light beam is modulated whilst the focused beam is moved modulating the predetermined change to the refractive index that is proportional to the intensity (paragraph 0051);

in which no laser-induced breakdown of the crystal in the path has occurred (paragraph 0039);

wherein the beam is focused by a microscope objective (paragraph 0012);

in which the focused beam is moved periodically along the path (paragraph 17);

wherein the optical structure comprises multiple waveguides having plurality of coupled waveguides (paragraph 0023).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 4-5, 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miguez.

Miguez discloses a method of altering the refractive index of a region of a crystal, and a crystal thus altered as discussed above. Although, Miguez discloses the use of pulsed laser beams to alter refractive index of waveguide crystal, it does not disclose that such altered refractive index results in formation of short period gratings. On the other hand, the use of laser beam pulse for forming short period gratings is well known in the art. Short period gratings formed by laser pulses are advantageously and desirably used in the art because such gratings provide highly accurate and precise optical signal processing with high predictive reliability. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method and the device disclosed in Miguez to be used in forming optical waveguide short period gratings as claimed in the present application.

Claims 13-22, 25, 28, 30-31, 60-61, 65-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miguez in view of US Patent Application Publication No. US 2005/0169591 A1 to Broeng et al. (hereinafter "Broeng").

Miguez discloses a method of altering the refractive index of a region of a crystal, and a crystal thus altered as discussed above. Nevertheless, it does not explicitly teach such optical waveguide crystal is doped with a metal and used as a laser crystal as claimed in the instant application. On the other hand, the use of optical waveguide crystal as a laser crystal having the core doped with a metal (such as erbium) is known in the art as taught by Broeng (paragraph 0098). Broeng also discloses the use of co-doping (paragraph 0098). Such formation of laser cavity is considered advantageous and desirable because lasers permit production of high powered optical signals for long distance optical signal transmission. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the invention of Miguez to form laser device as taught by Broeng.

Regarding claims 19-22, although Miguez discloses the use of pulsed laser for forming altered refractive index regions, it does not explicitly teach the pulse duration, frequency and energy in the range claimed in the present application. On the other hand, it has long been established that "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation" *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). MPEP 2144.05. Since Miguez fully teaches the general conditions of the above mentioned claims, discovery of optimum ranges of laser pulse duration, frequency and energy is not considered inventive.

Claims 12, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miguez in view of Broeng as applied to claims above, and in further view of JP 08-316562 (hereinafter "JP'562").

Miguez, in view of Broeng, renders claimed limitations obvious as discussed above. However, it does not explicitly teach the use of crystal selected from the group consisting of YAG, Forstertyte, Vanadate, LiSAF, GSGG, or Sapphire as claimed. On the other hand, the use of such crystal as waveguide laser is known in the art as taught by JP'562 (abstract). Such crystals are advantageously used in the art to provide optical waveguide laser with desired predetermined wavelength range for optimum optical signal transmission. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the device of Miguez and Broeng to use crystals selected from the group consisting of YAG, Forstertyte, Vanadate, LiSAF, GSGG, or Sapphire as claimed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SUNG H. PAK whose telephone number is (571)272-2353. The examiner can normally be reached on Monday- Friday, 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Uyen-Chau Le can be reached on (571)272-2397. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sung H. Pak/
Primary Examiner, Art Unit 2874